WHAT IS CLAIMED IS:

1. An apparatus for applying components of one or more source materials to spatially addressable, predefined locations onto a substrate, the apparatus comprising:

at least one source material; and

a potential assembly for applying a spatially varying potential across said substrate, said spatially varying potential causing components of said source material to deposit at said spatially addressable, predefined locations.

2. The apparatus of claim 1, wherein said spatially varying potential is a spatially varying electric potential.

3. The apparatus of claim 1, wherein said spatially varying potential is a spatially varying magnetic potential.

4. The apparatus of claim 1, wherein said spatially varying potential is a spatially varying chemical potential.

5. The apparatus of claim 2, wherein the potential assembly comprises a power source and an array of spatially addressable working electrodes coupled to or embedded within said substrate, said working electrodes being coupled to said power source such that a different potential may be applied to each of said working electrodes.

6. The apparatus of claim 5, further comprising a reference electrode coupled to said power source.

7. The apparatus of claim 5, further comprising a plurality of reference electrodes coupled to said power source, wherein each of said reference electrodes is located adjacent to each of said spatially addressable working electrodes.

8. The apparatus of claim 5, wherein each of said spatially addressable, predefined locations is defined by each of said working electrodes.

9. The apparatus of claim 2, further comprising an ionic solution in contact with said substrate.

10. The apparatus of claim 1, wherein said substrate is formed from a material selected from the group consisting of polymers, plastics, pyrex, quartz, resins, silicon, and silica-based materials.

11. The apparatus of claim 5, wherein said substrate comprises silicon dioxide and said spatially addressable working electrodes are metal electrodes.

12. The apparatus of claim 1, further comprising an enclosure housing said substrate therein, wherein said substrate is immersed in a bath of said source material.

13. The apparatus of claim 12, wherein said bath further comprises a solution of ions.

14. The apparatus of claim 2, wherein said potential assembly comprises a working electrode and a reference electrode, wherein said electric potential of said working electrode varies substantially continuously across a surface of said working electrode.

15. The apparatus of claim 14, wherein said substrate is a resistive material.

16. The apparatus of claim 3, wherein said potential assembly comprises an array of spatially addressable magnets each having a pole positioned adjacent said substrate.

17. The apparatus of claim 16, wherein said magnets are coupled to or embedded in the substrate.

18. The apparatus of claim 16, wherein said source materials possess net magnetic moments, and wherein said magnets create spatially addressable magnetic field gradients that attract components of said source materials such that said source materials accumulate adjacent to each of said magnets in proportion to a field strength of each of said magnets.

19. The apparatus of claim 4, wherein said source material is positioned relative to said substrate such that a flux of said components deposited onto said substrate varies across said substrate.

20. The apparatus of claim 19, wherein said source material comprises an isotropic point molecular source.

21. The apparatus of claim 19, wherein said substrate and said source material are movable relative to each other such that a spatially varying pattern of combinations of materials may be deposited onto said substrate.

22. The apparatus of claim 19, further comprising a transport matrix positioned between said substrate and said source material, said transport matrix providing a diffusion mask for said source materials, said diffusion mask controlling deposition of said components of said source materials onto said spatially addressable, predefined regions.

23. The apparatus of claim 1, wherein said potential assembly is configured to apply said components of said source materials onto said substrate in patterns, said patterns allowing comparison of specific material characteristics of said materials deposited at said spatially addressable, predefined locations.

24. The apparatus of claim 1, wherein said potential assembly is capable of depositing at least 9 different materials to at least 9 different locations of said spatially addressable, predefined locations.

25. The apparatus of claim 1, wherein said substrate comprises at least 1 spatially addressable, predefined location per square centimeter.

26. A method of applying components of one or more source materials to spatially addressable, predefined locations on a substrate, said method comprising the steps of:

applying a spatially varying potential across said substrate; and

depositing at least two components of at least one source material onto at least two spatially addressable, predefined locations on said substrate.

27. The method of claim 26, wherein said applied spatially varying potential is an electric potential.

28. The method of claim 26, wherein said applied spatially varying potential is a magnetic potential.

29. The method of claim 26, wherein said applied spatially varying potential is a chemical potential.

30. The method of claim 27, wherein said depositing step comprises contacting said substrate with an ionic solution to generate electrochemical deposition of said components of said source material.

31. The method of claim 27, wherein said applying step comprises applying said electrical potential to a plurality of spatially addressable working electrodes located at said spatially addressable, predefined locations, wherein said electric potential varies at each working electrode to vary said component deposited onto said corresponding spatially addressable, predefined location.

32. The method of claim 26, wherein said applying step comprises:

applying an electrical potential to a working electrode, wherein said electrical potential varies along a length and a width of said working electrode;

providing a first component of said source materials to said working electrode to deposit said first component onto a first spatially addressable, predefined location; and

providing a second component of said source materials to said working electrode to deposit said second component onto a second spatially addressable, predefined location.

33. The method of claim 26, wherein said applying step comprises applying a spatially varying magnetic potential to an array of spatially addressable magnets, each magnet having a pole positioned adjacent to said substrate.

34. The method of claim 29, wherein said applying step comprises delivering a first component of said source material positioned a distance from said substrate, and allowing first component of said source material to deposit onto said substrate such that a flux of components varies across said substrate.

35. The method of claim 34, further comprising the steps of:

moving said source material relative to said substrate; and

delivering a second component from said source material to generate a spatially varying pattern of combinations of said first and second components on said substrate.

36. The method of claim 26, further comprising applying the components of said source materials onto said substrate in patterns that allow comparison of at least one specific material characteristic.

37. The method of claim 26, wherein at least 9 different materials are deposited on at least 9 different locations of said spatially addressable, predefined locations.

38. A material having a desired property prepared by a process comprising the steps of:

applying a spatially varying potential across a substrate;

depositing at least ten components of at least one source material onto at least ten predefined, spatially addressable locations on said substrate to form an array of resulting materials on said substrate;

screening said array of resulting materials for said desired property; and

determining which of said screened resulting materials has said desired property.

39. An apparatus for screening a plurality of materials for a specific material characteristic, the apparatus comprising:

an array, wherein said plurality of materials correspond to a plurality of predefined locations on said array;

a plurality of electrodes, wherein said plurality of electrodes correspond to said plurality of predefined locations; and

means associated with said plurality of electrodes for testing each of said plurality of materials for said specific material characteristic.

40. The apparatus of claim 39, wherein said specific material characteristic is an AC impedance.

add 13

add 12

add E3